

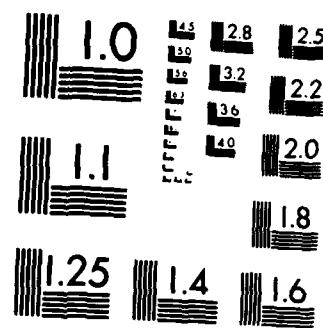
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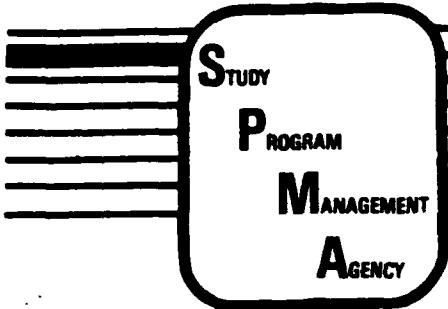
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# ARMY STUDY HIGHLIGHTS

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October 14, 1987

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Volume VIII of the Army Study Highlights represents the selection of six recently completed high-quality Army studies. The purpose of this publication is to acknowledge outstanding contributions of individual analysts and encourage continuing excellence in the Army analysis community.

The studies selected for this document represent examples of efforts that were professionally conducted and are of significance to the Army's goals and missions. Selections were based on an assessment of the principal findings, main assumptions, principal limitations, scope, objectives and approach of each study. Since great benefits are derived from the methodology used in conducting good study efforts and these studies are representative of that, I urge you to make the widest distribution possible throughout your organization.

Your continued suggestions or requests for additional copies of the Army Studies Highlights should be directed to Ms. Gloria Brown, of my office, AV 227-0026/(C) 202/697-0026.

*Joann Langston*  
JOANN H. LANGSTON, SES, Director  
Study Program Management Agency  
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of the Army (Operations Research)



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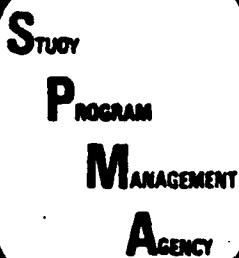
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## ENGINEER ANALYSIS OF THE LIGHT INFANTRY DIVISION (ELID)

STUDY  
GIST

### THE PRINCIPAL FINDINGS:

(1) The divisional engineer battalion, working alone, can successfully support the Light Infantry Division (LID) during the initial phase of a short-duration, low-intensity conflict. However, the LID needs immediate Echelon-Above-Division (EAD) augmentation to support extended low-intensity situations and all mid- to high-intensity conflicts. Specific recommendations for theater augmentation units are detailed in the study.

(2) The mix of engineer equipment in the current divisional battalion needs to be changed to better align capabilities with the most vital combat requirements. Equipment mix and density recommendations were made that do not increase the C-141 deployment profiles of the LID engineer battalion.

(3) The LID will greatly benefit from the fielding of advanced land mining systems. New scatterable and improved conventional mine systems will both increase the range of mobility and countermobility tasks the division can undertake, and substantially reduce the Class IV and V transportation requirements.

### THE MAIN ASSUMPTIONS:

(1) The LID Table of Organization and Equipment is fixed as of November 1985 and the equipment listed is assumed available.

(2) The two JIFFY scenarios developed by the US Army Combined Arms Operations Research Activity, and the division's operational concept published by the Combined Arms Combat Development Activity accurately reflect LID combat operations. Engineer requirement calculations are based on these scenarios and concepts.

(3) The type and quantity of EAD units that are supporting the LID within the division sector are adequately defined by the scenarios.

THE PRINCIPAL LIMITATIONS: The requirements generated and the resulting conclusions and recommendations were limited by three considerations: (1) no personnel increases could be made in the engineer force structure, (2) Equipment changes must be attainable without increases in deployment transportation assets, and (3) the sponsor must be able to initiate or influence any action recommended.

THE SCOPE OF THE STUDY: This study: (1) analyzed the engineer requirements and capabilities of the LID in two wartime scenarios (Latin America and Europe); (2) ranked all light engineer tasks and calculated requirements by battle phase and area within the division AO; (3) determined Class IV and V requirements to support division mobility and countermobility operations; (4) identified the EAD engineer units needed to augment the division if it is deployed to either scenario location; (5) analyzed the engineer unit capability to support priority missions and recommended organizational changes at both division and EAD levels; (6) proposed bridge support alternatives for large-gap bridging operations (LID).

THE STUDY OBJECTIVE: This study determined realistic LID engineer requirements, ranked them, and compared them to engineer capabilities during different scenario battle phases and time periods. The key to this process

was to involve both the Study Advisory Group (SAG) and representatives of the 7th Infantry Division (Light) in identifying actual user needs.

**THE BASIC APPROACH:** The approach has five main levels of resolution:

(1) A Latin American and European scenario were selected to represent a range of the LID's employment options. For purposes of evaluating unit design options, these scenarios were weighted 2:1, respectively, based on the division's operational concept and employment potential.

(2) Each scenario was divided into phases that looked at deployment and lodgement, defensive preparations, and separate offensive and defensive actions.

(3) For each battle phase, requirements and capability were tracked for committed brigades plus the Division Rear Area.

(4) Engineer capability was computed down to company-sized units in squad-hours and five classes of dominant equipment-hours.

(5) Areas of special interest were investigated in 12 separate study excursions, including: EAD unit support alternatives, engineer area support concepts, impact of future mine and explosive systems, major equipment mix alternatives, and more drastic organizational changes.

**REASONS FOR PERFORMING THE STUDY:**

The organizational design and the concept of operations for the divisional engineer battalion of the Light Infantry Division is a drastic and untested departure from other divisional battalions. The division and especially the engineer battalion were downsized to meet manpower and deployability constraints, thus eliminating many of the capabilities traditionally associated with divisional engineers. The sponsor requested a detailed analysis of wartime engineer requirements in order to validate unit design and equipment needs, estimate proper EAD engineer augmentation requirements, and subjectively assess the impact of unfulfilled requirements on the division's performance.

**STUDY SPONSOR:** Commander, Army Development and Employment Agency (ADEA), Fort Lewis, Washington 98433-5000.

**IMPACT OF STUDY:** The study's 21 conclusions and 17 recommendations were accepted by the study sponsor (ADEA). The study results are now being used as a basis for engineer structure evaluation, mission planning, and force structuring of engineer augmentation packages for war contingency areas.

**PERFORMING ORGANIZATION AND PRINCIPAL AUTHORS:** The performing organization was the US Army Engineer Studies Center (ESC). The principal authors were Mr. Douglas K. Lehmann, Project Manager; MAJ James A. Milobowski, Senior Analyst; CPT(P) John D. Kiser, Mr. Robert B. Grundborg, and Mr. Rueben E. Harris, Analysts; and Mrs. Jean A. Lamrouex, Associate Analyst.

**DTIC ACCESSION NUMBER** of the final report is DA306748.

**COMMENTS AND QUESTIONS MAY BE SENT TO:** US Army Engineer Studies Center, Casey Building #2594, Fort Belvoir, VA 22060-5583; POC: Mr. Bruce W. Springfield, AUTOVON 345-2280.

**DATES OF STUDY:** Start -- 1 August 85; final SAG and draft report -- 4 September 86; published study -- December 86 (four analytical man-years expended).



## MEASURING RELATIVE CAPABILITIES OF ARMY FORCES - EUROPE (MERCAF-EUR)

STUDY  
GIST  
CAA-SR-86-27

**THE REASON FOR PERFORMING THE STUDY.** For the past two years, the Measuring Improved Capabilities of Army Forces (MICAF) Studies have estimated improvements in combat potential of major US combat units relative to a fixed Soviet threat. These studies provided a clear picture of improvements due to US modernization but did not study the impact of concurrent Soviet modernization. The MERCAF-EUR Study was undertaken to determine whether US modernization is keeping pace with Soviet force improvements through the 1980s.

**THE PRINCIPAL FINDINGS** reported in the work are:

- (1) Rates of capability improvement for selected US division-level forces between 1980 and 1989 relative to an improving Soviet threat, and the principal contributing factors.
- (2) Rates of capability improvement for selected Soviet division forces from 1980 to 1989 relative to an improving US force, and the principal contributing factors.
- (3) Comparisons of capability improvements in US and Soviet division-level forces between 1980 and 1989 and trends in the shifting balance in these forces.

**THE MAIN ASSUMPTIONS** are:

- (1) The actual combat capability of Army combat organizations is adequately approximated by the measure "combat organization potential (COP)" produced by the MERCAF-EUR process.
- (2) Exclusion of antiarmor operations by US and Soviet close air support (CAS) does not significantly distort estimates of US or Soviet combat organization capability (Note: US and Soviet CAS aircraft only engaged enemy ground air defense systems).

**THE PRINCIPAL LIMITATIONS** which may affect the findings are:

- (1) Estimates of combat capability mainly reflect combat equipment performance capabilities and levels of equipment onhand in combat organizations. Limitations to achieving full capability of these equipments, such as shortages of combat support/combat service support (CS/CSS) equipment, munitions and spares, degraded weather conditions (mist/fog), tactical use of obscurants, inadequacies in training, and strategic mobility and other nonequipment constraints are not reflected.

(2) Estimates do not reflect the contribution of echelon-above-division forces of war reserve stocks on either side.

(3) Capabilities of US combat organizations do not reflect stocks of pre-positioned materiel configured to unit sets (POMCUS) or redistribution of POMCUS uncovered residual equipment (PURE).

(4) Changes in quantity and quality of small arms in US and Soviet units are not reflected.

**THE SCOPE OF THE STUDY** was to compare capability improvements of selected US and Soviet forces from 1980 to 1985 to 1989. All division-level forces oriented toward the North Atlantic Treaty Organization (NATO) central region in a NATO-only conventional conflict were evaluated. Estimates reflect the quality and quantity of weapon systems onhand in these units by year. They also reflect ammunition modernization and weapon performance under clear day and clear night conditions for four distinct tactical missions. Neither echelon-above-division forces nor combat service support capability were evaluated.

**THE STUDY OBJECTIVES** were:

(1) To estimate the relative combat potential of specified (division-level) US and Soviet forces in the years 1980, 1985, and 1989.

(2) To identify key factors contributing to differences between US and Soviet combat potential levels and rates of improvement in the year 1980, 1985, and 1989.

**THE BASIC APPROACH** was to adapt the MICAF capability computing process to the unique requirements of MERCAF-EUR. This process involves several separate data processing, combat modeling and analytical steps. These include: selecting and defining the US and Soviet units to be examined; designing several US and threat notional divisions representative of major segments of the overall forces to be evaluated; evaluating each notional division against the appropriate threat through detailed combat modeling; using an analytic process to generalize results of detailed combat modeling to determine the overall US and Soviet force combat potential and improvements over time; and analysis of results.

**THE STUDY SPONSOR** was the Director for Operations, Readiness, and Mobilization, Office of the Deputy Chief of Staff for Operations and Plans.

**THE STUDY EFFORT** was directed by LTC Allen R. Christensen, Requirements Directorate.

**COMMENTS AND QUESTIONS** may be directed to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-RQ, 8120 Woodmont Avenue, Bethesda, Maryland 20814-2797, AVN 295-5252.

**THE PRINCIPLE FINDINGS:** The Army needs new techniques to better manage and control the cost of its Information Mission Area (IMA) resources for the sustaining base (i.e., all information resources except strategic and tactical). The Army should:

(1) Implement improved management and control techniques which will lead to more effective and efficient use of information resources by the Army.

(2) Implement cost reporting and recovery techniques which will establish a buyer/seller relationship between the user (buyer) and the provider (seller) of IMA services.

(3) Implement techniques that provide Army users with multiple sources from which to buy IMA services, including both Army and non-Army sources.

(4) Establish a revolving fund to help manage the finances of the Army providers.

(5) Use a phased approach to implement the new management techniques. This will provide Army personnel time to adapt to the major changes that will occur in the way the Army provides IMA services for the sustaining base.

**THE MAIN ASSUMPTIONS:** The study was conducted under the following assumptions:

(1) The Army will manage its IMA resources in a more business-like manner.

(2) The benefits received will exceed the costs to create and maintain the new management techniques.

(3) The new management techniques will be consistent with Office of Management and Budget (OMB), General Accounting Office (GAO), DoD, and Army regulatory guidance including OMB Circular A-130, GAO Technical Pamphlet No. 4, and Federal Information Processing Standards Publication Number 96.

(4) Where new management techniques conflict with regulatory guidance, the Army will seek exceptions to the guidance.

**THE PRINCIPAL LIMITATIONS:** The principal limitations were the size and complexity of the Army's IMA and the amount of time available to complete the study. The study team employed a methodology, detailed in the Basic Approach, to overcome these limitations; however, it was not possible to visit all Army sites.

**THE SCOPE OF STUDY:** The scope of this study was to design techniques and develop an implementation plan to enable the Army to more efficiently and effectively manage the resources used to provide IMA services. Specifically, the study was to identify the best practices within the industry for managing information resources and then tailor those practices for use by the Army. The practices were to cover all categories of the Army's IMA: automation, telecommunications (voice and data), printing and publications, visual information, mail, records management, and libraries.

**THE STUDY OBJECTIVES:** The overall objective of this study was to develop new techniques that would allow the Army to better manage and control the costs of the resources used to provide IMA services. The specific objectives of the study were to provide an environment in which:

(1) Users have multiple sources from which to buy IMA services.

(2) Army service providers can operate more like a business and where their services are sold to the Army users.

(3) Users and Army providers have better information on the costs of using and providing IMA services.

(4) Economic principles encourage users to efficiently utilize and Army providers to efficiently provide IMA services.

(5) Modern information technology can be acquired quickly and efficiently.

**THE BASIC APPROACH:** The study team used the following methods:

(1) First, the Army contracted with Vance Government Systems (Vance) to define the Army's cost reporting and recovery requirements, to identify the Army's baseline cost reporting and recovery capabilities, to survey other Government agencies and private industry companies for techniques used to manage information resources, and to develop a preliminary design and implementation plan of new management techniques for the Army's IMA sustaining base.

(2) Second, the Army contracted with Sage Institute International (Sage) to conduct a failure avoidance analysis of Vance's preliminary design and implementation plan. This consisted of asking a large number of Army managers to review Vance's document and identify the major failure points. Vance was allowed to participate in this process. Sage's results consisted of identification of critical issues that if not resolved would cause Vance's recommendations to fail.

(3) Third, Vance corrected the failures identified by Sage and, using additional information that Vance collected from participating in the Sage analysis, developed a final design and implementation plan.

**REASONS FOR PERFORMING THE STUDY:** There were two primary reasons why the Army performed this study. First, the Army has continually strived to manage its information resources more effectively and efficiently. In 1984, the Army established the IMA to provide better management control of all assets that support the total Army strategic, tactical, and sustaining base requirements. Second, OMB issued Circular A-130 in December 1985 directing all Federal agencies to implement business-like management techniques for all information resources. The formation of the IMA and Circular A-130 led Army managers to look for new techniques to manage information resources.

**SPONSOR:** COA (now ASA( FM) and ACSIM (now DISC4)

**IMPACT OF STUDY:** The Army is implementing the study's recommendations. These recommendations will have a profound impact on the entire Army, changing the way information resources are acquired and managed. The study's final design and implementation plan provides the Army with the means to initiate innovative techniques for managing its information resources. The proposed techniques are detailed, and the implementation plan presents a viable approach to implementing the techniques throughout the Army. Also, the final design addresses each critical failure point identified in the failure avoidance study.

**PERFORMING ORGANIZATION AND PRINCIPAL:** The performing organizations were Vance Government Systems and Sage Institute International. The principal Vance author is Mr. Dean Halstead. The principal Sage author is Dr. Keith Jones.

**DTIC ACCESSION NUMBER:** Presently not available.

**COMMENTS AND QUESTIONS MAY BE SENT TO:** Vance Government Systems, 7726 Old Springhouse Road, McLean, Virginia 22102, (703) 734-1477; Sage Institute International, 226 West 2230 North, Provo, Utah 84604, (801) 374-8070; or SAFM-BPF, attn: Erin Houseman, (202) 695-3040.

**START AND COMPLETION DATE OF THE STUDY:** September 1986 - July 1987



TRAC-WSMR-TR-23-86

TACTICAL TERRAIN INTERVISIBILITY CLASSIFICATION STUDY

STUDY  
GIST

**THE REASON FOR PERFORMING THE STUDY.** The study was requested by the ABCA Quadripartite Working Group on Operational Research (QWG/AOR) in order to: (1) develop intervisibility information characteristic of military environments; (2) determine whether a terrain classification system could be developed which would predict these characteristics; and (3) provide the results to the military community for further evaluation and usage.

**THE PRINCIPAL RESULTS.** Methodology was developed for classifying terrain with regard to landform, surface clutter, and tactical deployment. Thirty high-resolution scenarios were constructed and used to generate several types of intervisibility statistics. The scenarios are documented in Volume III of this report. Classification parameters were linked with intervisibility characteristics to provide predictive mathematical equations and look-up tables. The estimating procedures are believed to have an associated error of not more than 15-25 percent for most conditions studied. Intervisibility was found to be highly sensitive to differences in vegetation/urban clutter separation and viewpoint factor.

**THE MAIN ASSUMPTIONS.** Thirty scenarios provide an adequate basis for constructing a classification system. The scenarios represent likely battlefield deployments. The terrain compartments selected are sufficiently homogeneous to permit classification and linking with intervisibility data. Digital topographic data and computer software are sufficiently mature to allow the realistic portrayal of battlefield intervisibility.

**THE MAJOR RESTRICTIONS.** The absence of data precluded the evaluation of tropical/jungle regions. Line-of-sight (LOS) was corrected for earth curvature, but not for refraction. Other atmospheric degradation was ignored. The study employed a digital terrain resolution of 50 meters horizontal and 1.0 meters vertical. The analysis was limited to the prediction of ground-to-ground intervisibility.

**THE SCOPE OF THE STUDY.** The research studied and characterized intervisibility conditions in portions of Central Europe, the Middle East, Korea, and Australia. Intervisibility measurements included: LOS probability as a function of range (PLOS); conditional PLOS to N surrounding targets; measures of correlated intervisibility; distributions of in-view and out-of-view attack path segment lengths; and distributions of first and expected opening ranges of engagement. These data are preserved in their entirety in Volume IV of the report, which is constructed in the form of an analyst's data book.

**THE STUDY OBJECTIVE.** This work is expected to provide long-term benefits to analysts and tacticians faced with understanding the environment and using it to military advantage. The study objective was to provide a tool for quickly estimating intervisibility conditions in a region without resorting to large-scale field tests or computer simulations.

THE BASIC APPROACH. The study utilized literature searches, employment of the existing Natick Landform Classification System, and development of surface clutter and tactical taxonomies to further describe the environment. Computer models were developed to digitize and analyze scenarios and to extract LOS statistics and classification parameters from digital topographic data bases. Multivariate analysis and pattern recognition techniques were employed to relate independent and dependent variables.

THE STUDY SPONSOR. The study was sponsored by the US Deputy Under Secretary of the Army for Operations Research, as executive agent for the ABCA Quadripartite Working Group on Army Operational Research. The study was further supported by the ABCA Special Working Party on Terrain Descriptions.

THE STUDY PROPOSER. The Director, TRADOC Operations Research Activity (TORA\*).

THE ANALYSIS AGENCY. USATRASANA\*, with support from the UK Defence Operational Analysis Establishment.



TACTICAL WHEELED VEHICLE  
COST AND OPERATIONAL  
EFFECTIVENESS ANALYSIS

STUDY  
GIST

PRINCIPAL FINDINGS:

1. The Family of Medium Tactical Vehicles (FMTV) program meets the Joint Service Operational Requirements (JSOR), fills current vehicle shortages and reverses the unacceptable aging of the 2-1/2 and 5-ton truck fleets which are virtually beyond their effective life.
2. The Maneuver Oriented Ammunition Distribution System (MOADS) with the Palletized Load System (PLS) vehicle provides 100 percent throughput to the battalion field trains area with combat configured loads of ammunition delivering more ammunition with 29 percent fewer trucks than the present delivery system.

MAIN ASSUMPTIONS:

For the production and operating quantities used in the analysis, program assumptions are made in the procurement schedule, attrition of vehicles, and vehicles in the Service Life Extension Program (SLEP). Only overage or attrited vehicles will be replaced. An Updated Technical Data Package (UTDP) estimate of system performance and effectiveness is based on dimensional and weight characteristics of current vehicles.

PRINCIPAL LIMITATIONS:

1. The FMTV program considers four primary new buy options. Also, four other options are reviewed which replicate the primary ones but include a SLEP for a portion of the requirement, there is no "do nothing" base case.
2. The MOADS and PLS analysis limited alternatives to those equally as effective as the current capacity.

SCOPE OF THE STUDY:

1. Two separate COEAs, FMTV and PLS, are combined into one COEA on the Tactical Wheeled Vehicle (TWV) to support both material acquisition programs. The merger allows an examination of the synergism which exists between medium (FMTV) and heavy 5, 10, and 16-ton vehicle alternatives to satisfy ammunition requirements.

2. The study period is from 1987 to 2006.

STUDY OBJECTIVE:

The basic objective of this study is to determine which FMTV and PLS alternatives constitute the most cost and operationally effective fleet of vehicles.

BASIC APPROACH:

The FMTV and PLS requirements are based on the Program Objective Memorandum (POM) 92 force requirements. The FMTV analysis considered the age and current quantity of the vehicles to determine vehicle requirements. The PLS analysis used the transportation and supply activities (TRANSACT) model, a simulation model, to measure the performance and effectiveness of a distribution network.

REASONS FOR PERFORMING THE STUDY:

This COEA is to support the Army System Acquisition Review Council (ASARC) Milestone I/II decision on program initiation for a family(ies) of medium (FMTV) and heavy (PLS) tactical wheeled vehicles in the 1988/89 budget submission: FMTV is to overcome non-ammunition general supply Mission Area Analysis (MAA) and AOE deficiencies; PLS is to overcome the current MAA ammunition deficiency and to introduce operating efficiencies in the ammunition distribution system.

STUDY IMPACT:

1. The FMTV program provides increased effectiveness in mission tasks, better deployability and improved system benefits. Reliability, availability and Maintainability (RAM) will be improved as well as trafficability and agility. Medium truck life cycle costs are reduced between \$2.6 and \$3.1 billion, and include a reduction of approximately 3600 maintenance personnel.

2. PLS will revolutionize the Army's ammunition delivery system and reduce life cycle cost in the heavy truck fleet by \$0.6 billion. It will reduce approximately 3600 personnel in the ammunition distribution area, and lighten the logistical tail of the total army by approximately 3900 trucks, trailers and loaders.

STUDY SPONSOR: Department of the Army.

PERFORMING ORGANIZATION AND PRINCIPAL AUTHORS:

U.S. Army Transportation School, Directorate of Combat Developments, Concepts and Studies Division, LTC John B. Tier III, CPT(P) Joseph M. Steinberger, CPT(P) Kendall S. Wallin, Mr. James DeLucia, Mr. Sam Sparrer; assisted by Mr. Tom Edwards, CPT Jack Bedford, and Mr. Sherman S. Cockrell of the U.S. Army Logistics Center.

DTIC ACCESSION NUMBER OF FINAL REPORT: Not yet assigned.

COMMENTS AND QUESTIONS MAY BE SENT TO:

U.S. Army Transportation School  
ATTN: ATSP-CDC/CPT Steinberger  
Fort Eustis, VA 23604  
AUTOVON 927-4334/3892.

START AND COMPLETION DATE OF STUDY: December 1986 - May 1987



## TOPOGRAPHIC ASSESSMENT, PACIFIC

STUDY  
GIST

### THE PRINCIPAL FINDINGS

- (1) The analytical models developed for this study provided the first realistic means of assessing the quantities of standard and nonstandard topographic products required by a military force in combat, and of assessing the manpower effort, by command level and by MOS, required to meet those requirements.
- (2) Current topographic force structures for all potential theaters of operation should be reviewed in light of techniques developed in the study to ensure the proper support force is available.
- (3) US topographic support forces for the Pacific Theater are adequate for a Korean conflict, but are malpositioned.
- (4) Republic of Korea Army (ROKA) forces lack essential topographic support.
- (5) Current initiatives to enhance topographic support forces in the Pacific for US and ROKA forces need to be pursued.

### THE MAIN ASSUMPTIONS

- (1) The operation plans for the defense of the ROK and Combined Forces Command (CFC) accurately reflect deployment schedules, current capabilities, and the progress of the potential conflict.
- (2) The Total Army Analysis-92 topographic force is implemented and will remain in effect through 1990.
- (3) Map supply and distribution in Korea will remain an Army topographic engineer function through 1990.
- (4) The topographic data bases used to produce nonstandard topographic products are available for the area of operations and at all levels of topographic support.

### THE PRINCIPAL LIMITATIONS

- (1) The study assessed topographic requirements for only one conflict in one area of operations in a theater which could see concurrent conflicts in several areas of operations, all with reliance on the same topographic support forces.
- (2) Information about the detailed composition of some combat forces (e.g., Marine Amphibious Forces) was not available, so their requirements may be understated.
- (3) No data were available on the impact of new topographic equipment which may be fielded by 1990.

### THE SCOPE OF THE STUDY

- (1) Describes topographic requirements for two scenarios developed from operations plans.
- (2) Quantifies requirements for standard and nonstandard topographic products using new analytical methods and models.
- (3) Develops workload factors that convert product requirements to manhours.
- (4) Estimates topographic capability based on in-place and deploying military units by command and skill levels.

(5) Determines the US Pacific Command's wartime support requirements, and projects how its current and anticipated topographic support capability will satisfy those requirements in all topographic functional areas.

THE STUDY OBJECTIVES: This study:

- (1) Assesses and quantifies topographic requirements by scenario phase and by support level.
- (2) Develops priorities for topographic support.
- (3) Quantifies US topographic engineer capability to satisfy requirements.
- (4) Compares requirements with capability.
- (5) Identifies and recommends actions to help eliminate deficiencies in topographic support.

BASIC APPROACH

The basic approach for this study was to determine topographic product requirements, both standard and nonstandard, using new analytical techniques and models. These requirements were then compared (by scenario phase, support level, and skill) with in-place and deploying topographic capabilities (also computed by new analytical techniques) to determine the location and magnitude of support deficiencies. Recommendations were then made to overcome the deficiencies within the limits of force structure availability.

REASONS FOR PERFORMING STUDY

The study was performed to provide the sponsor with a realistic assessment of his topographic support capability to meet the most likely threat in the theater, and to provide a guide for topographic support force restructuring and/or augmentation.

STUDY IMPACT

- (1) The study enabled the sponsor to successfully defend his topographic support force from reductions proposed by the Total Army Analysis-93.
- (2) Other study recommendations are being implemented as feasible.

STUDY SPONSOR

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DTIC ACCESSION NUMBER: C954070

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START AND COMPLETION DATES OF STUDY:

Volume I: Mar 85 - Dec 86.  
Volume II: Oct 85 - Jun 87.